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SOVIET BLOC TRADE PATTERNS
IN NONMILITARY ELECTRONIC EQUIPMENT
1958-65

DIRECTORATE OF INTELLIGENCE
Office of Research and Reports

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FOREWORD

This report provides estimates of the magnitude, direction, and composition of the foreign trade in nonmilitary electronic goods of the USSR and the six fully participating Eastern European members of CEMA during 1958-65, as well as an appraisal of the relative size of the contribution made by each of these countries to that trade. The estimates cover only international shipments of electronic and communications goods and are exclusive of the value of technical assistance programs, training programs, and sale of manufacturing licenses.

The quality of the statistical estimates varies and reflects primarily the completeness of the published trade statistics. Although much of the analysis is based on fragmentary data, it is believed that national totals of exports and imports fall within an acceptable range of confidence. Estimates for 1965 are preliminary.

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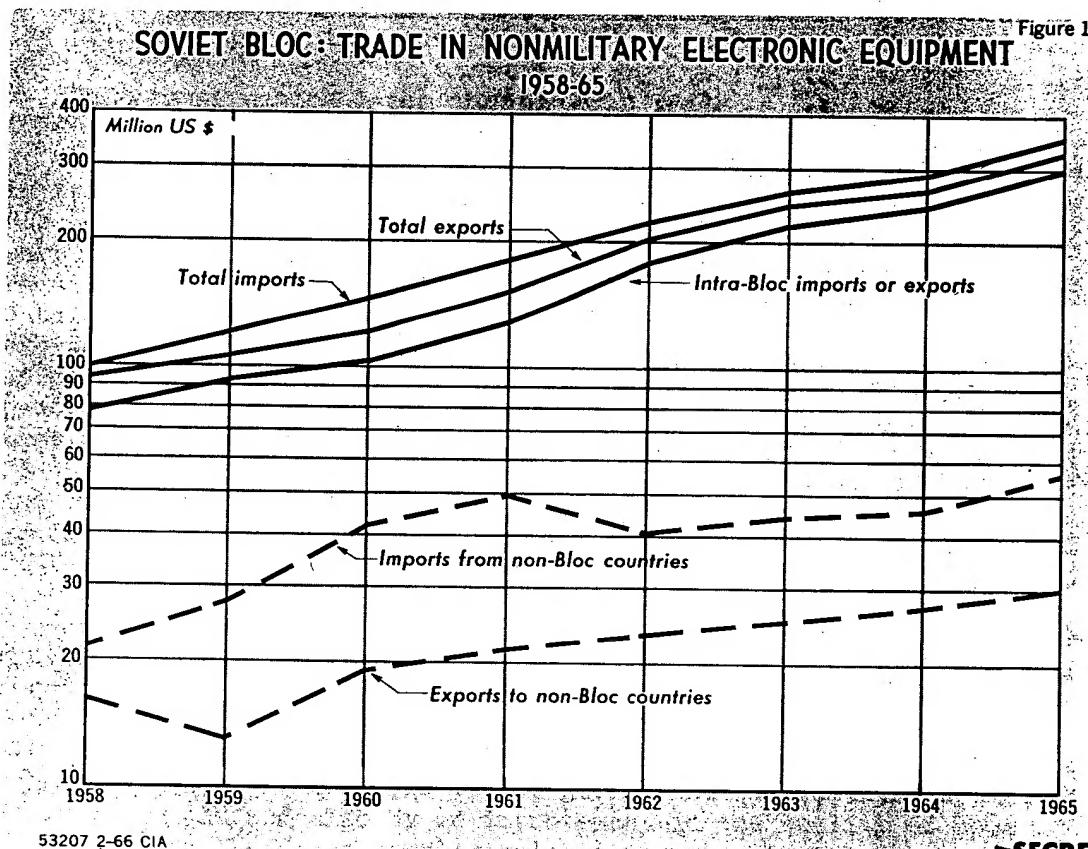
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SOVIET BLOC TRADE PATTERNS
IN NONMILITARY ELECTRONIC EQUIPMENT*
1958-65

Summary

The foreign trade of the Soviet Bloc in electronic goods grew rapidly during 1958-65, mainly as a result of the greater interdependence among the Communist countries of Eastern Europe (see Figure 1). Trade in these goods with non-Bloc countries grew less rapidly as the Bloc developed an improved capability to satisfy its needs for electronics from its own production.



* The estimates and conclusions in this report represent the best judgment of this Office as of 15 February 1966. The terms Soviet Bloc and Bloc as used in this report include the USSR and the Eastern European Communist countries (or Eastern Europe) -- Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Rumania.

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The Communists imported from the Free World small quantities of advanced or specialized equipment to solve specific technological problems that had been retarding the development of their electronics industries. The very considerable increase in Soviet imports of electronics from the Eastern European countries was only partly compensated for by Soviet exports to these countries. Virtually all Soviet imports from Eastern Europe consisted of nonmilitary electronic goods because of the high priority given in the USSR to the production of military electronics. Important trends in the structure of the trade were the growing dominance of communications gear and the emergence of coordinated international specialization among the Eastern European countries in the production of electronic components.

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I. General

It is estimated that Soviet Bloc trade in electronics in 1965 totaled more than three times that in 1958 (see Table 1). The growth rate on the import side was comparatively steady throughout most of the 1958-65 period, as shown in Figure 1. Although the Free World provided substantial quantities of electronic goods to the Soviet Bloc, the countries of the Bloc depended on one another for the bulk of their electronic imports (see Figure 2). Moreover, they marketed a very small share (no more than 10 percent since 1962) of their exports of electronics in non-Bloc countries (see Figure 3).

The principal Bloc exporters of electronic goods were Hungary, East Germany, and Czechoslovakia (see Table 2). The principal importers were the USSR, Poland, and Czechoslovakia. The USSR, Poland, Bulgaria, and Rumania imported more electronics than they exported, whereas Hungary, Czechoslovakia, and East Germany were net suppliers of these goods. A comparison of the production and exports of electronics by the principal producing countries is shown in Table 3 and Figure 4.

II. Factors Affecting Rates of Growth of Trade

During the three-year period 1961-63 an accelerated rate of growth in trade resulted in an exchange of electronic goods among the Soviet Bloc countries in 1963 that was more than double that in 1960. In part this acceleration was the result of rapidly increasing Soviet requirements for electronics for defense purposes. Although the USSR obtained a steeply increasing volume of defense electronics from an expansion of domestic producing facilities, the concomitant lowering of priority for domestic production of nonmilitary electronics expanded the Soviet market for nonmilitary electronic imports from the Eastern European countries. In 1962, Soviet imports from these countries -- consisting almost wholly of communications equipment and instruments and of components of industrial and entertainment grade (see Figure 5) -- were about 2.6 times the amount in 1958 (see Tables 4 and 5).

Another factor which contributed to the growth of exports from the Eastern European countries to the USSR, as well as to trade among these countries, was the general maturing of the electronics industries of the principal producing countries among the former Satellites. This situation was characterized by a disproportionately large rise in the volume of output of some electronic goods relative to the increase in domestic demand and also by an improvement in the quality of some goods, making them more readily salable in other Bloc countries. The exchange of technical information and production licenses among the Bloc countries was an important factor in the product improvement achieved by the Eastern European electronics industries. For example, the Hungarian industry was able to produce transmission equipment for

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VESNA broadband microwave communications systems under license from the USSR with Soviet technical assistance, and (with Czechoslovak licensing and technical help) the East German electronics industry added crossbar telephone exchanges to its export catalogue.

III. International Specialization

The increased specialization in electronics production which took place among the individual Eastern European countries is reflected in the fact that exports by all the Eastern European countries increased and those in East Germany, Czechoslovakia, and Poland grew at a higher rate than production (see Table 3 and Figure 4). Although available export data for individual countries cannot be satisfactorily subdivided to show the country of destination, fragmentary information on the recent electronics trade of the Eastern European countries (except Hungary) indicates that their exports were received in increasing volume not only by the USSR but also by each other. Hungary participated less than the others in Eastern European trade. Nearly 85 percent of Hungary's exports of electronics were received by the USSR, and the remainder was divided about equally between the non-Bloc countries and the other Eastern European countries. Moreover, about two-thirds of Hungary's imports of electronics were obtained from outside the Bloc. Consequently, although Hungary participated with the other Eastern European countries in international specialization programs, it was less dependent than they were on such programs.

International specialization in the production of electronics occurred among these countries as a result of both deliberate agreement and the natural evolutionary development of traditional specialties. International specialization in the production of electron tubes commonly used by all Bloc countries was undertaken by common agreement among Czechoslovakia, Hungary, East Germany, and Poland in 1962. This development resulted in increased output and reduced production costs and also in a large increase in the numbers of electron tubes exchanged among these countries and shipped by them to the USSR.

Some apparent specialization -- for example, the production of electro-optical instruments in East Germany and the production of communications equipment in Czechoslovakia -- represented the natural development of lines of products for which particular countries have traditionally enjoyed a good reputation in the export market.

Another cause for de facto (as distinguished from CEMA-imposed) specialization among the Eastern European countries is found in the influence of the USSR, because of whose patronage and with whose technical assistance economic production of certain electronic goods became possible for some of these countries. For example, Czechoslovakia now has a dominant position among them in the production of low-capacity microwave carrier equipment as a result of having produced the KNK-6 six-channel carrier equipment in large quantities on Soviet

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order for several years. The production capacity that was built in response to a secure Soviet market gave Czechoslovakia an advantage over the other Eastern European countries in developing this particular product for intra-Bloc sale as well as for the growing market in less developed countries. Thus the USSR unilaterally induced an international division of labor among its former satellites through its importance in their export markets.

As the requirements for new forms of electronic products are generated at an increasing pace in the Bloc and as the resources of the individual countries are strained in an effort to maintain a modern line of product, these countries are finding it in their individual interests to share the cost of developing and bringing into production the new, advanced components which their industries must have. In East Germany, for example, the plan for providing the electronics industry with recently devised components of advanced design provides for importing from other Bloc countries those components that are only needed in quantities too meager to justify the cost of domestic development and production. The need to develop a variety of communications equipment for modern national and international communications nets exceeds the research and development resources of any single Eastern European country. A certain amount of international sharing, by deliberate arrangement, of development and production tasks in this field is reflected in the disproportionately rapid growth in exports of communications equipment (overwhelmingly intra-Bloc in nature) compared with export growth in other categories of electronics, as shown in Table 6.

IV. Trends in Intra-Bloc Trade

Associated with these changes in the electronics industries in the Eastern European countries were changes in the direction of electronics trade. The share of total imports from each other has been growing in size while the shares obtained from the USSR and from non-Bloc countries have been shrinking. Moreover, the Soviet share of the total electronic exports of the former satellites has been increasing (from about 35 percent in 1959 to about 45 percent in 1965). In particular categories of electronics -- that is, electronic instruments and communications gear -- these countries marketed more than one-half of their exports in the USSR during 1958-65. The USSR also purchased more than one-third of the components exported by the Eastern European countries during this period. Although the estimated value of Soviet imports of electronic equipment from these countries amounted to less than 1.5 percent of the total domestic Soviet production of such equipment (both military and nonmilitary), these imports, which were primarily nonmilitary, represent a significant portion of the supply of electronic equipment available to Soviet industry and consumers. During 1962-65, estimated Soviet imports of civil communications equipment and industrial and consumer-grade electron tubes from

these countries equaled 10 to 15 percent of total estimated Soviet production, and imports of instruments from them equaled nearly 10 percent of the annual Soviet production of industrial instruments and control equipment.

V. Trends in Trade Between the Bloc and Non-Bloc Countries

The Bloc imports both ordinary and specialized electronic equipment from non-Bloc countries. In 1962 and thereafter, generally successful efforts were made to reduce its dependence on non-Bloc sources. An absolute reduction of the aggregate amount imported from these sources was made in 1962, and, although imports from these countries began to rise again thereafter, they comprised an ever-diminishing share of total Bloc imports (see Table 7). As shown in Table 8, in 1962 and probably thereafter all categories of electronic goods (except instruments) imported from non-Bloc countries experienced a noticeable decline. In the whole period 1958-65, instruments comprised about one-half of the electronics imported by the Bloc from non-Bloc countries, only East Germany having reduced such imports since 1962. The Bloc (and particularly the Eastern European countries) continued to remain dependent on countries of the Free World for those advanced forms of electronic instruments which were widely available from commercial sources in industrialized Western countries but which were frequently available in the Bloc only from special laboratory production. Prominent among such goods are oscilloscopes and other meters for checking radio frequency circuits and automatic data processing equipment (both computers and peripheral associated input-output equipment).

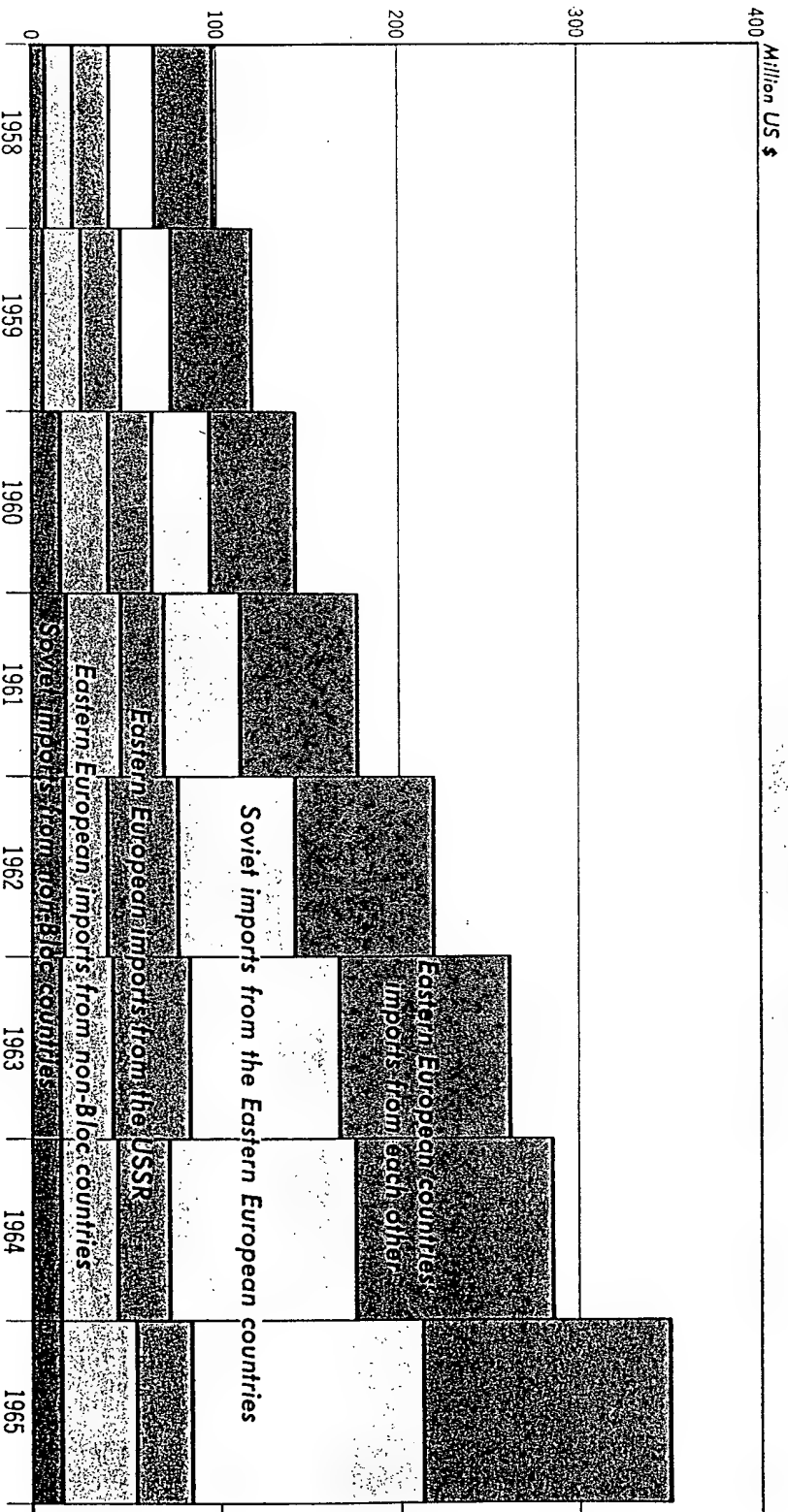
The quality of electronic goods produced in the Bloc and available for export is variable and seldom embodies the most recent developments in the Free World technology. The export prices of Soviet Bloc electronic goods are based on prices in Free World markets, and in negotiating trade agreements with one another the Bloc countries quote Free World prices. In selling to the Free World the Bloc countries have been hampered by difficulties in providing service-after-sale and have had to accept lower prices than Free World sellers, even for goods of equal value.

It is likely that Bloc electronics offered for export in the foreseeable future will continue to be generally inferior to similar Free World products in quality and in the provision of service-after-sale and that Bloc imports from non-Bloc countries will continue to exceed exports to that area.

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Figure 2

SOVIET BLOC IMPORTS OF NONMILITARY ELECTRONIC EQUIPMENT FROM BLOC AND NON-BLOC COUNTRIES 1958-65



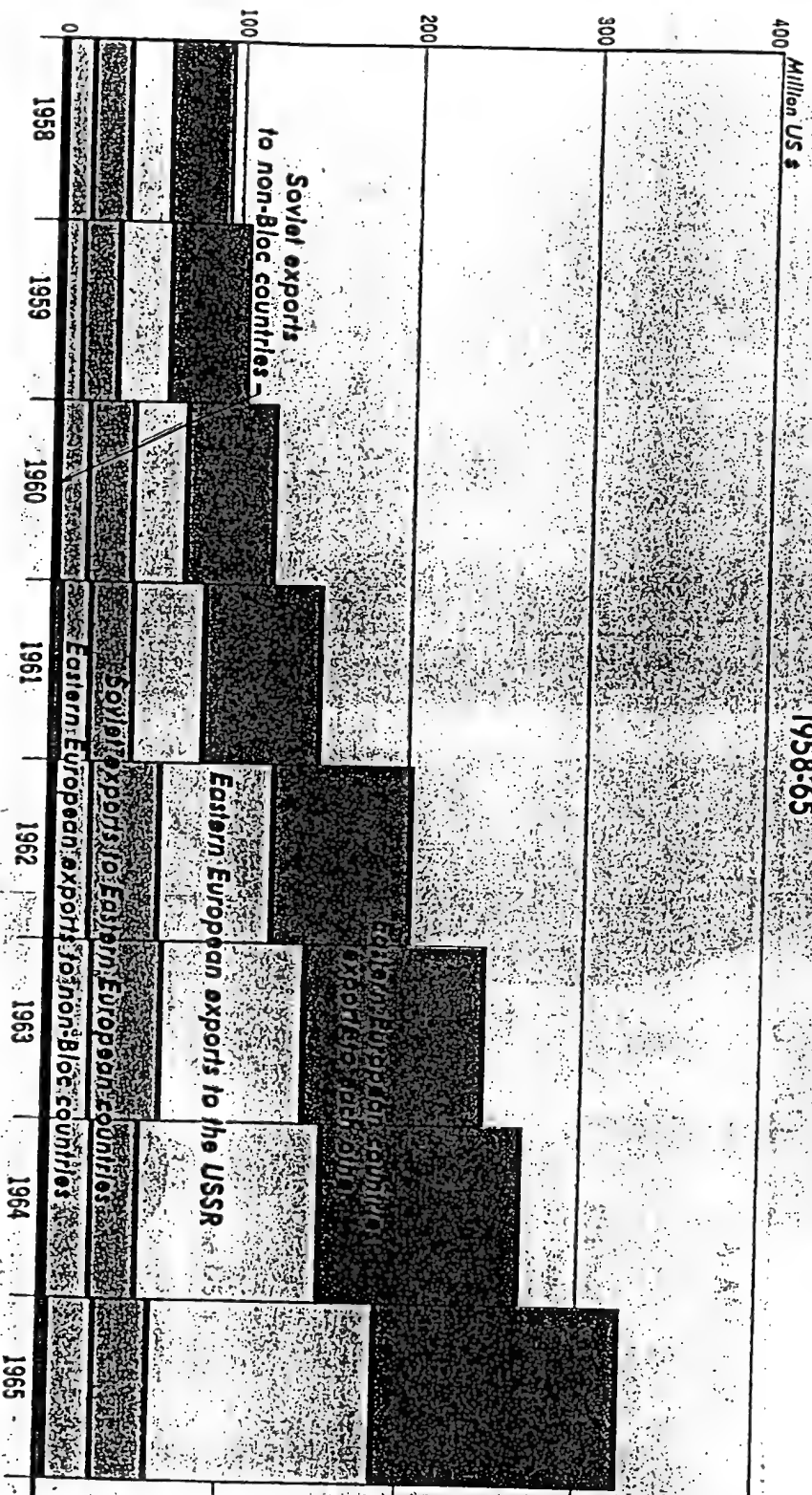
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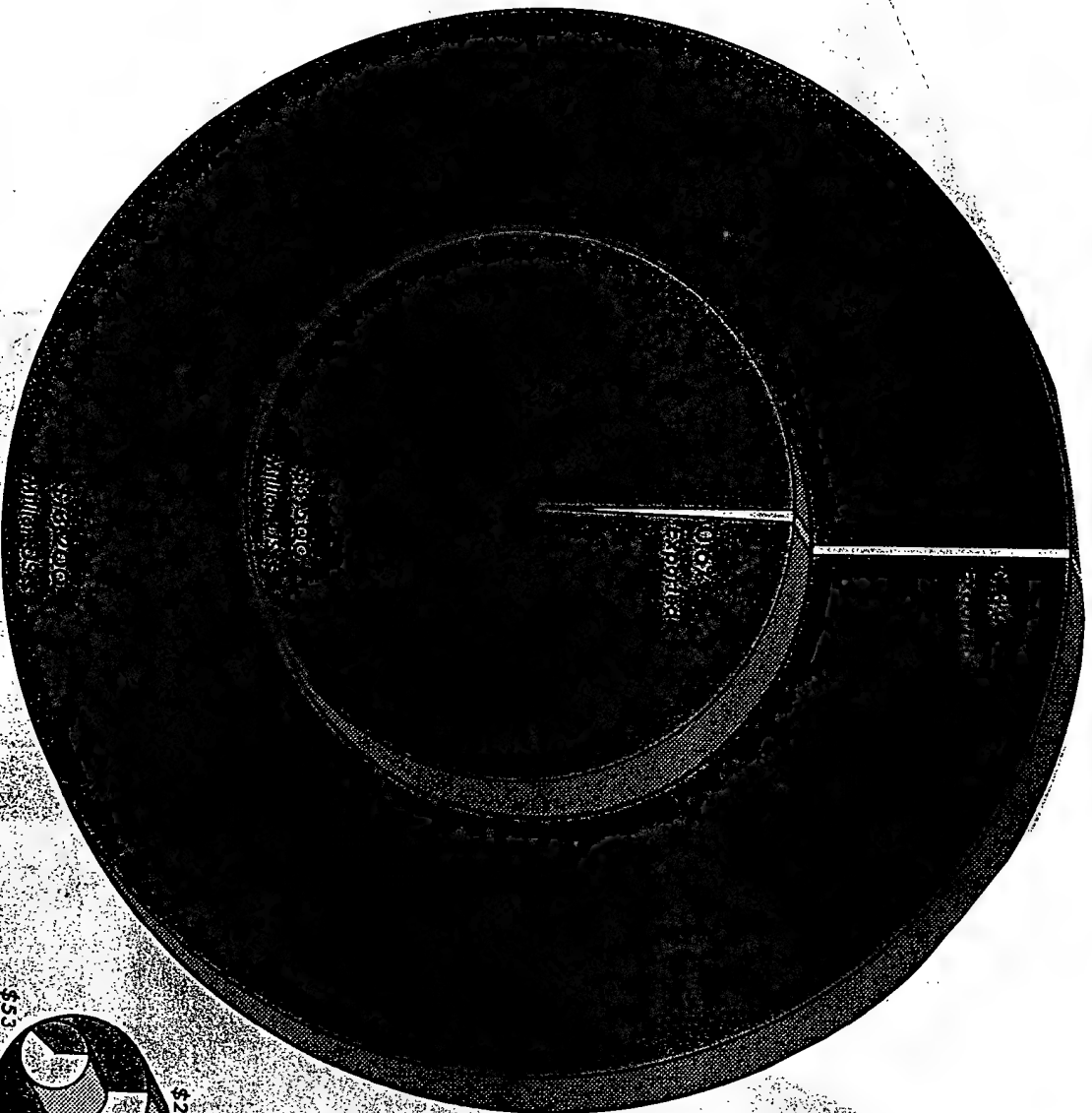
SOVIET BLOC
EXPORTS OF NONMILITARY ELECTRONIC EQUIPMENT
TO BLOC AND NON-BLOC COUNTRIES

FIGURE 3

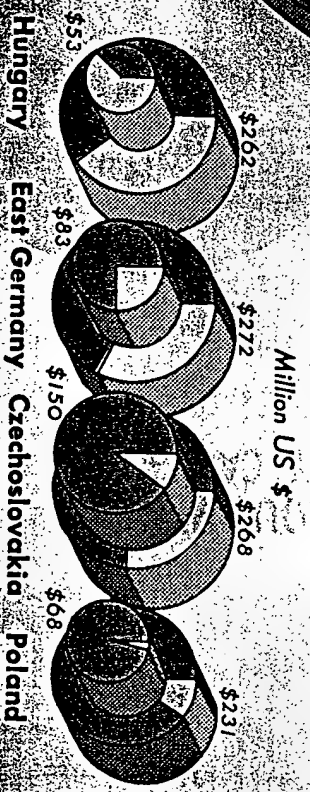


SELECTED SOVIET BLOC COUNTRIES EXPORTS OF NONMILITARY ELECTRONIC EQUIPMENT COMPARED WITH PRODUCTION OF ALL ELECTRONIC EQUIPMENT 1958 AND 1965

Figure 4



■ Total production, 1958
 ■ Exports, 1958
 ■ Total production, 1965
 ■ Exports, 1965



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USSR

Figure 5

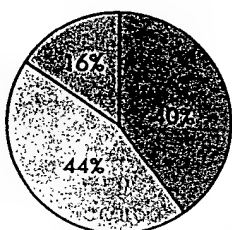
TRADE IN NONMILITARY ELECTRONIC EQUIPMENT WITH EASTERN EUROPEAN COUNTRIES, BY CATEGORY

1958, 1962, AND 1965

Million US \$

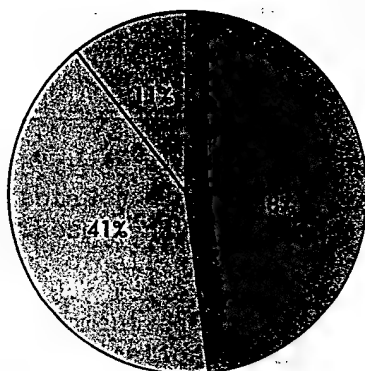
- Communications equipment
- Instruments
- Components
- Consumer entertainment equipment

NET IMPORTS



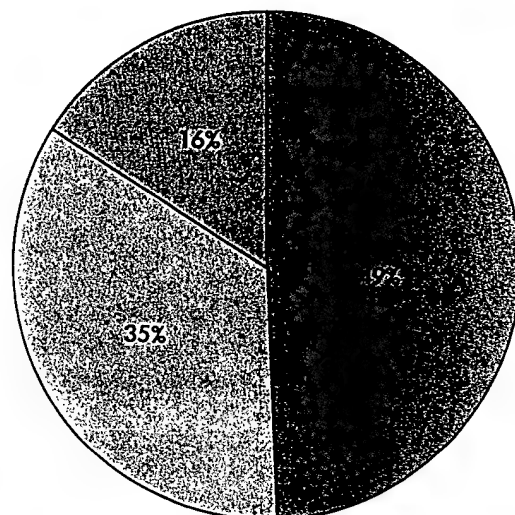
\$24

1958



\$63

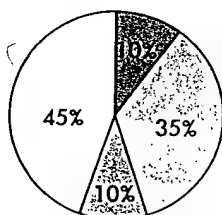
1962



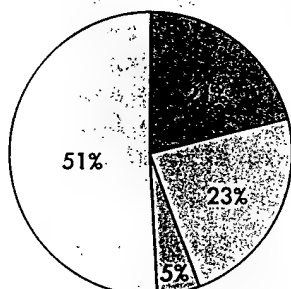
\$127

1965

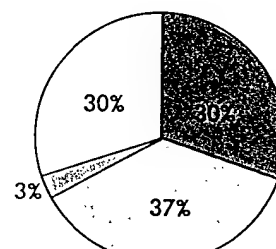
NET EXPORTS



\$21



\$39



\$30

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APPENDIX A

METHODOLOGY

1. General

The methods employed in the analysis of Soviet Bloc foreign trade in electronics were dictated by the nature of the available data. It was not possible to develop a complete trade pattern for the Bloc and to show, in matrix form, the amounts imported by each recipient country from each exporting country. The most intensive analysis of the data resulted in an estimate by year of the total amounts of electronic equipment (by major category) that were exported or imported by each Bloc country. The determination of the direction of trade was restricted to the division of trade into that moving in intra-Bloc trade and that exchanged with non-Bloc countries. It was seldom possible to be more specific than this with respect to country of origin of imports or of destination of exports.

2. The Data and Its Treatment

The available trade handbooks seldom give complete statistics. The division of total trade into commodity categories typically is accomplished in these handbooks in a manner that makes impossible the subsequent summing of all exports or imports of a particular industry -- namely, electronics. For example, the Soviet trade handbooks itemize exports of entertainment equipment and instruments, but exports of components and communications equipment are not listed although known to have occurred. Moreover, the reporting on instruments is imperfect for the purposes of this report because it contains both electronic and nonelectronic instruments.

Not every Bloc country publishes a statistical handbook on foreign trade, and these handbooks do not appear until the expiration of a year or more after the last year for which data are quoted. Advantage, where possible, was taken of the bilaterality of trade, in order to determine the imports and exports of nonreporting countries from a study of the exports and imports of all the reporting countries that trade with them.

Additional pieces were added to the picture from published official statements of the trade plans and achievements for the electronics industries of the several Bloc countries. These statements sometimes gave export figures as shares of total domestic output, making the accuracy of the export estimate dependent on the accuracy of a production estimate.

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Although the best estimates are those based on openly published statistics, intelligence reports provided fragmentary but useful data in some instances. This fragmentary information served principally to weight the interpolations and extrapolations that had to be made for those years for which data from published sources were incomplete.

3. Exchange Rates

All values in this report are expressed in US dollars. Where Bloc trade data have been taken from official statistical handbooks, their value has been converted to US dollars by the application of the appropriate official exchange rate (crown/dollar, zloty/dollar, and the like). The procedure is valid because the statistical compilations of Bloc countries present data on trade with non-Bloc countries in values that reflect the actual prices paid converted to domestic currency at the official exchange rate. Moreover, prices set artificially in intra-Bloc trade more or less reflect world market prices converted at official rates. Where Bloc trade estimates have been based on production data and reflect domestic prices, exchange rates have been employed that represent the ratio of domestic prices and dollar prices for similar items of electronic equipment.

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APPENDIX B

STATISTICAL TABLES

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Table 1

Soviet Bloc: Estimated Trade in Nonmilitary Electronic Equipment
with Bloc and Non-Bloc Countries
1958-65

	Exports								Imports							
	1958	1959	1960	1961	1962	1963	1964	1965	1958	1959	1960	1961	1962	1963	1964	1965
	Million US \$															
Total a/	94	105	121	150	201	244	268	325	22	112	143	176	218	262	286	350
Intra-Bloc	77	91	102	128	179	219	241	295	77	91	102	128	179	219	241	295
With non-Bloc countries	16	13	19	21	23	25	27	30	21	27	41	48	40	43	45	55
	Percent															
Annual rate of growth of total	11.7	15.2	24.0	34.0	21.4	9.8	21.3	20.2	20.2	23.1	23.9	20.2	9.2	22.4		
a. Because of rounding, components may not add to the totals shown.																

a. Because of rounding, components may not add to the totals shown.

Table 2

Soviet Bloc: Estimated Trade
in Nonmilitary Electronic Equipment, by Bloc Country
1958-65

		Million US \$												
		Exports						Imports						
		1958	1959	1960	1961	1962	1963	1964	1965	1958	1959	1960	1961	1962
Total a/		24	105	121	150	201	244	268	325	99	119	143	176	218
USSR		21	22	25	27	42	42	31	34	30	35	44	57	79
Bulgaria		1	1	1	2	4	5	6	7	5	7	10	15	17
Czechoslovakia		15	20	21	35	48	54	61	70	15	18	22	26	41
East Germany		21	24	29	35	45	60	67	88	7	13	19	21	16
Hungary		33	35	39	43	50	70	85	104	4	9	9	8	8
Poland		2	3	4	8	12	14	17	21	15	17	20	30	35
Rumania		Negl.	Negl.	Negl.	Negl.	Negl.	Negl.	Negl.	Negl.	7	10	12	15	17
Unallocated										16	10	7	4	5

a. Because of rounding, components may not add to the totals shown.

Table 3
Selected Soviet Bloc Countries: Exports of Nonmilitary Electronic Equipment
Compared with Production of All Electronic Equipment
1958 and 1965

Country	1958			1965		
	Production	Exports	Exports as a Percent of Production	Production	Exports	Exports as a Percent of Production
USSR	3,500	21	0.6	13,200	34	0.3
Hungary	53	33	62.3	262	104	39.7
East Germany	83	21	25.3	272	88	32.4
Czechoslovakia	150	15	10.0	268	70	26.1
Poland	68	2	2.9	231	21	9.1

Table 4

USSR: Estimated Trade in Nonmilitary Electronic Equipment, by Category
1958-65

	Million US \$															
	Exports								Imports							
	1958	1959	1960	1961	1962	1963	1964	1965	1958	1959	1960	1961	1962	1963	1964	1965
Total a/	<u>21</u>	<u>22</u>	<u>25</u>	<u>27</u>	<u>42</u>	<u>42</u>	<u>31</u>	<u>34</u>	<u>30</u>	<u>35</u>	<u>44</u>	<u>57</u>	<u>79</u>	<u>95</u>	<u>115</u>	<u>140</u>
Communications equipment	2	3	4	6	8	10	10	10	12	12	12	23	32	43	52	64
Instruments	7	7	7	8	10	9	11	12	14	18	23	28	38	40	47	55
Components	2	2	2	2	2	2	2	2	4	4	4	5	8	11	15	21
Consumer entertainment equipment	10	10	12	10	21	21	8	10	1	1	5	2	1	1	1	1

a. Because of rounding, components may not add to the totals shown.

Table 5

USSR: Estimated Trade in Nonmilitary Electronic Equipment
with Bloc and Non-Bloc Countries
1958-65

		Million US \$															
		Exports									Imports						
		1958	1959	1960	1961	1962	1963	1964	1965	1958	1959	1960	1961	1962	1963	1964	1965
Total a/	21	21	22	25	27	42	42	31	34	30	35	44	57	72	95	115	140
Bloc	21 b/	21 b/	21 b/	24 b/	23	39	39	28	30	24	28	30	41	63	82	102	127
Non-Bloc	1	1	1	1	4	3	3	3	4	7	6	14	17	16	13	13	13

a. Because of rounding, components may not add to the totals shown.

b. Because of inadequate data, the value of exports to the Asian Communist countries, principally Communist China, cannot be separated from exports to the Eastern European Communist countries; however, this is of concern only during 1958-60, when Soviet exports of electronic goods to Far Eastern Communist countries probably approached \$7 million per year. After 1960 these exports became insignificant.

Table 6

Soviet Bloc: Estimated Trade in Nonmilitary Electronic Equipment, by Category
1958-65

		Million US \$															
		Exports						Imports									
		1958	1959	1960	1961	1962	1963	1964	1965	1958	1959	1960	1961	1962	1963	1964	1965
Total a/		<u>94</u>	<u>105</u>	<u>121</u>	<u>150</u>	<u>201</u>	<u>244</u>	<u>268</u>	<u>325</u>	<u>99</u>	<u>119</u>	<u>143</u>	<u>176</u>	<u>218</u>	<u>262</u>	<u>286</u>	<u>350</u>
Communications equipment		21	26	29	41	65	88	105	128	23	28	30	46	65	N.A.	N.A.	N.A.
Instruments		33	35	40	48	59	67	80	94	34	43	54	60	75	N.A.	N.A.	N.A.
Components		13	14	16	17	21	32	37	40	15	17	19	24	23	N.A.	N.A.	N.A.
Consumer entertainment equipment		27	30	36	44	56	57	46	63	27	30	39	46	55	N.A.	N.A.	N.A.

a. Because of rounding, components may not add to the totals shown.

Table 7

Soviet Bloc: Estimated Trade in Nonmilitary Electronic Equipment
with Non-Bloc Countries, by Bloc Country
1958-65

		Exports									Imports								Million US \$
		1958	1959	1960	1961	1962	1963	1964	1965	1958	1959	1960	1961	1962	1963	1964	1965		
Total a/		16	13	12	21	23	25	27	30	21	27	41	48	40	43	45	55		
USSR		1	1	1	4	3	3	3	4	7	6	14	17	16	13	13	13		
Bulgaria		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	1	1	1	1	1	N.A.	N.A.	N.A.		
Czechoslovakia		4	3	3	4	5	5	5	5	2	3	3	3	3	N.A.	N.A.	N.A.		
East Germany		5	4	6	7	8	9	10	11	4	6	8	8	3	N.A.	N.A.	N.A.		
Hungary		3	3	5	6	7	7	8	9	3	6	6	5	5	6	6	6		
Poland		1	N.A.	1	1	1	1	1	1	4	5	8	8	8	N.A.	N.A.	N.A.		
Rumania		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	1	1	5	5	N.A.	N.A.	N.A.		

Table 8

Soviet Bloc: Estimated Trade in Nonmilitary Electronic Equipment
with Non-Bloc Countries, by Category
1958-65

	Million US \$															
	Exports								Imports							
	1958	1959	1960	1961	1962	1963	1964	1965	1958	1959	1960	1961	1962	1963	1964	1965
Total a/	16	13	19	21	23	25	27	30	21	27	41	48	40	43	45	55
Communications equipment	2	1	4	7	7	7	7	8	4	4	5	12	7	N.A.	N.A.	N.A.
Instruments	9	6	8	8	9	9	10	11	11	14	21	21	25	N.A.	N.A.	N.A.
Components	2	4	3	3	3	4	4	5	4	7	7	10	5	N.A.	N.A.	N.A.
Consumer entertainment equipment	3	2	4	3	4	5	5	6	2	3	7	5	3	N.A.	N.A.	N.A.

a. Because of rounding, components may not add to the totals shown.